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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/052,815
Filing Date: January 18, 2002
Appellant(s): WIMMER ET AL.

Stephen R. Ormiston
For Appellant

EXAMINER'S ANSWER

This is in response to the amended Appeal Brief filed 5/15/2008 appealing from the Office action mailed 2/28/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

This appeal involves claims 1-5, 7-21, 25-26 & 33-36.

Claims 6, 22-24 & 27-32 have been canceled.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters.

The brief is deficient because Appellants' summary has failed to provide citations in the specification for where appellants have redefined commonly understood terms, such that they have different scope than the common meaning of the words. In particular, page 6, lines 18-29, of the **original**

specification redefine the meaning of "**an adhesive**", where it is stated "Adhesive, as used herein, is generally defined as **any substance** that may be **coupled to** the treated surface of the **substrate**. Adhesive **includes** any material that provides or promotes adhesion between the substrate and the material itself. **Any material** that may flow or conform and adhere to the surface of the substrate **may be an adhesive**. ... The adhesive also may itself be a second component that is to be attached to the substrate for example a part that may be treated and a second more compliant part that may be pressed into the treated part creating a bond" (emphasis added). Therefore, while appellants' redefinition of the noun "adhesive" encompasses the normal meaning of the term, it is re-defined to have a broader meaning for use in this application, so as to encompass any substance that adheres to the surface of the substrate, i.e. any film or any laminate or any object, etc., that may adhere or bond to the treated surface is defined as "an adhesive" for purposes of these claims in light of the specification. The limitation of "an adhesive" is relevant to all the independent claims.

With respect to appellants' limitation of "an initiator" used in independent **claim 1**, in their discussion of the summary on page 3 of the amended appeal brief of 5/15/2008, appellants have cited page 9, line 28-page 10, line 1, which is relevant to a particular configuration, but which is not necessitated by the claim language, being directed to "cone initiators 56", that illustrates a mechanism for forming structures that is encompassed by independent claim 1, although not necessitated by the claim language. On page 8, lines 9-11, of the original specification, is a more general statement, reciting "the laser radiation ablates the substrate, but does not ablate initiators which are the precursors of structures formed by the ablation process", thus providing a more general showing of what appears to be intended by "**initiator**" in claim 1, which effectively encompasses common techniques, such as shadow masks. However, the summary discussion of figures 4 & 5, with ref.#'s therefrom, might imply that structures as shown in these figures are necessarily being formed, however this is not necessarily the case. The requirement that "providing... the initiator configured to shadow... the substrate" does not say where or

when the shadow occurs, only under some unstated conditions, it must be capable of existing. Furthermore, the limitation of "directing a laser towards...the substrate to affect ablation of a non-shadowed portion of the substrate, a forming structures on...the substrate" does not necessitate that the shadowing had any part in forming the structures, or that shadowing was present at the time of ablation, only that ablation only occurs where there is no shadowing from the "initiator" or any other source, thus encompasses not directing the laser at portions of the substrate that are shadowed (whether by the "initiator" or something else) or where "initiators" reside, etc., thus essentially including any means employing a laser that creates structures on the surface, as long as they don't ablate any surface portion shadowed by the "initiator" or anything else.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct, although the 112, second rejections are withdrawn as noted below.

GROUNDS OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal, because they have not been presented for review in the appellant's brief.

Appellants have specifically stated on page 2 of their Brief that the rejection of **claims 1 & 8** under **35 USC 102 (b)** as being anticipated by **Burns et al**. (5,172,473) is not being appealed; thus, this rejection is uncontested & maintained.

It is additionally noted that the objection to the specification for introducing New Matter therein, which is petitionable (MPEP 608.04c), is maintained & has not been petitioned, hence, is effectively uncontested.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

The rejection of **claims 1-20 & 33-36 under 35 USC 112, second** paragraph is withdrawn.

With respect to claims 1, 10 & 18, in consideration of appellants' arguments on pages 6-8 of the brief, particularly with respect to intended use, and considering "bond" in light of cited discussion in the specification, & considering "bond" in its broadest sense, the body of the claims may be considered reasonably commensurate in scope with the preambles. With respect claim 3, in light of appellants' arguments on page 9 of their brief, plus considering that while a particle incorporated into the substrate surface is initially part of the surface, hence not shadowing it initially, as the ablation occurs, particles as discussed in claim 3 may effectively be considered to be above what has become the surface, thus, consistent with the claimed "initiator configured to shadow...". With respect claim 4, appellants' potential future willingness to amend the language in order to improve clarity is noted.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2005/0242059 A1	BRENNEN et al.	11-2005
6,919,162 B1	BRENNEN et al.	07-2005
TAYLOR et al.	"The Affects of Debris Formation on the Morphology of Excimer Laser Ablated Polymers", J. Applied Physics, **64**(5), p. 2815-2818	09-1988

KRAJNOVICH et al.	"Formation of 'Intrinsic' Surface Defects During 248 nm Photoablation of Polyimide", J. Applied Physics, **73**(6), p. 3001-3008	03-1993
5,172,473	BURNS et al.	12-1992
6,120,131	MURTHY et al.	09-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims: a

It is noted that the objection to the specification in section 2 of the action mailed 2/28/2007, bridging pages 3-4, is maintained, is a petitionable, not an appealable matter & has not been petitioned, hence, is effectively uncontested. The objection is noted as follows:

"The **amendment filed 11/24/2006** is objected to under **35 U.S.C. 132(a)** because it introduces **new matter** into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention…"

The following is a quotation of the appropriate paragraphs of **35 U.S.C. 102** that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of **35 U.S.C. 103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Appellants is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 7-8, 10-16, 18-20, 33 & 36 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Brennen et al**. (2005/0242059 A1 ≡ 6,919,162 B1), optionally in view of **Taylor et al**.

Brennen et al. discuss texturing polymeric or ceramic substrates via processes inclusive of laser ablation, where lower threshold fluence effects on surface ablation & formation of cones due to presence of small particles provided on the surface during processing are discussed, with roughening/texturing being done by the laser ablation, inclusive of options of choosing masks. Brennen et al. in (059), see Abstract; [0058], [0062-65], [0068-69], [0078], [0084-87], [0099], [0109], example 1 in [0126-0133] etc., with analogous teachings in Brennen et al. (162). While the Brennen et al. references do not explicitly teach the deposition of the debris material into texturing and cone formation, it may be considered inherent in the cone formation process with the controlled fluences as discussed, <u>or alternately</u> obvious to have formed cones with control, which included debris deposition for reasons as provided in the discussion of **Taylor et al.**, who provides means of affecting cone formation that include the debris deposition, which would've been applicable to the control of laser ablation parameters, especially given treatment of analogous materials and comparable laser fluences, as discussed in the Brennen et al. references.

With respect to depositing subsequent films that it adhere where the roughening/laser ablation as claimed promotes adhesion, while the invention set forth in Brennen et al. does not explicitly relate to this usage, in the discussion of the prior art in [0030] of (059) & analogously in the patent, it is noted that laser ablation to cause roughening is known to be used for promotion of the adhesion in subsequent processing a substrates; hence, it would've been obvious to one of ordinary skill in the art that the laser ablation roughening, inclusive of the cone formation process as described in Brennen et al., would have been reasonably expected to be effective for this known adhesion promotion technique, as analogous techniques have been shown to supply the required roughening with the required energy source of the prior art.

The claims were previously amended such that all now require the application of "an adhesive", wherein the adhesive has been redefined so that it is essentially inclusive of any coating which may be "flowed" on or conformed to the surface, where that coating provides or promotes its own adhesion. As previously noted, Brennen et al., as discussed in [0030] or equivalently in the patent, discuss the use of laser surface roughening for promotion of adhesion and subsequent processing of substrate, thus even with appellants' meaning of "an adhesive", it would have been obvious to one of ordinary skill in the art to have applied a coating material, which has some capability of its own of adhering to a surface that has been laser treated, as in Brennen et al., as laser roughening is suggested as an old and well-known adhesion pretreatment, and because the use of a laser technique, and which improves the adhesion of something that already has some degree of adhesion, is consistent with that teaching and would have been expected to be desirable whether the roughening enables adhesion or improves adhesion that would have been present otherwise, as well as consistent with appellants' redefinition of "an adhesive".

In [0086] of Brennen et al., please note the teaching that roughening using laser ablation "relies on the phenomenon known as cone or cone formation. This cone formation occurs when the fluence of a laser pulse at the substrate is not high enough to completely remove a whole layer of material. Even a

small particle of material that remains of the previous layer may be enough to initiate cone formation or cone-like features since this particle of material may not be removed by subsequent laser pulses but instead act as a sort of mask, creating a cone behind it as the laser ablates further down into the material around the particle" (emphasis added). Note, that this explicitly reads on the process as claimed by appellants in lines 3-8 of claim 1. Whether or not the "small particle" remaining on the surface was redeposited, or remained from the initial ablative of actions is irrelevant to the claims as written. The issue of deposition or resettling of debris from ablation is only necessary to the process in claims 2 & 10-21.

It was previously noted by appellants & then discussed by the examiner that in [0086] & [0128], the Brennen et al. references cite the Krajnovich (1993) article concerning particle formation in cone formation. Note that the carbon enrichment discussed by appellants on pages 21-22 of previous 11/24/2006 response, as proposed by Krajnovich et al. ("Formation of Intrinsic Surface Defects..." (1993), particularly see: abstract; p. 3002, 1st 2 full paragraphs; p. 3003, 2nd col.; page 2004 2nd col.; paragraph bridging p. 3005-6 & 1st col., p. 3006; & 1st 2 full paragraphs p. 3007), is an example of a technique which would read on appellants' claim 3, thus the use of such a technique does not exclude appellants claims 1, 3-4, 7-9, or 33-35. Brennen et al's citation in [0086] of Krajnovich et al., who show that their process of cone formation is due to local carbon enrichment of the surface being ablated, instead of ablation debris, does not preclude debris having any effect in Brennen et al., as Brennen et al. explicitly note the effect of remaining small particles, as well as citing Krajnovich et al., without explicitly saying how Krajnovich et al. apply to their particle discussion; therefore, appellants' exclusion of particles from debris of having any effect on Brennen et al.'s process was not considered warranted. Furthermore, while as the examiner previously stated, although Brennen et al. do not discuss deposition of debris material in cone formation, the term "small particle of material that remains" would generally be interpreted as being or including a piece of material separate from the substrate, and if it is a particle as taught & remains after

ablation, it would have been logical to one of ordinary skill to conclude that it is classifiable as ablation debris. Resettling may include leaving the surface and returning, or shifting around on the surface, which would inherently occur if the particle while not ejected, was separated from the surface, as the material of the particle could no longer possibly be in the same location as it previously resided, since the particle had been separated from a one surface location that no longer truly exists.

With respect to appellants' previous comments concerning [0095] of Brennen et al. discussing rapid ejection of ablation material, it was agreed by the examiner that rapid ejection does not necessarily imply resettling of ablation debris; however, it was also noted that it does not preclude it, nor does use of extrinsic masks exclude or include the presence of ablation debris, especially considering that appellants "initiator" & "shadowing" are defined and discussed so as to necessarily include such extrinsic masks.

If considering Brennen et al.'s teaching of remaining "small particle of material" to be ablation debris, the use thereof is then considered suggested by Brennen et al., and teachings of fluence in its effect on ablation ([0099], [0109], [0126-133], etc.). Alternately, as noted above Taylor et al. (The Effects of Debris Formation on the Morphology of Excimer Laser Ablated Polymers) specifically shows the effect that particulate material can play in debris formation, where it is noted that in the first paragraph Taylor et al. teach that the composition of this debris is mainly elemental carbon; hence, Taylor et al. would have been an obvious source of procedures & parameters for use in the cone formation taught in Brennen et al., as they relate to the taught cone formation from particles on the surface, as well as elemental carbon, which is consistent with the taught carbon enrichment of Krajnovich et al., as the reason that elemental carbon debris may initiate cone formation is analogous to why carbon enrichment of the surface may also initiate cone formation, especially as it makes clear that the use of one mechanism does not preclude the presence of the other.

Particularly with respect to Taylor et al., their process discusses laser ablates polymers, such as polyimides, where debris which is mostly elemental carbon from the laser ablation accumulates on the

surface forming symmetrical debris patterns, that can be varied depending on the laser fluence employed, such that higher fluences may create craters without cones, while lower influences will create simple cones. Taylor et al. note that at low fluences certain localized regions in the polymer are harder to ablate leading to accumulation of debris & growth of conical shaped structures. Particularly, see the abstract; the introductory paragraph on page 2815, particularly the top half of each column thereon; figure 1 on page 2816 which shows photographs of various debris patterns; the first column on page 2816 which discusses multiple laser shots for establishing debris patterns; the bottom of the second column on page 2816 which discusses debris with as being related to ablation thresholds; and the second column on page 2817, particularly the lower half, which discusses cone formation with respect to ablation thresholds fluences due to accumulation of ablated debris.

Taylor et al's teachings are directed towards polymers generally, with specific examples of polyimide or polyethylene terephthalate; hence, it would've been obvious that one of ordinary skill in the art to have applied the techniques of Taylor et al.'s process to virtually any class of polymers with the appropriate choice of laser/wavelength that with light absorbable by the particular polymer, thus making the class of liquid crystal polymers an obvious alternative, where one of ordinary skill would have used the general teachings provided by Taylor et al. for routine experimentation to determine what laser parameters were necessary in order to produce desired debris patterns on a specific polymer material.

With respect claim 36, Taylor et al. do not teach any particular height for any specific debris patterns produced on the polymer surface by laser ablation; however, in the second column on page 2817, it is indicated that for particular parameters, related to ablation thresholds and fluences applied, an agglomeration of debris products that cannot be further ablated can produce cones, where the "debris width" is related to parameters employed & the results of "screening effect produced by agglomeration of debris products". On the first column of page 2816, there's discussion of varying number of shots from the laser employed to produce debris patterns, and various diameters of cones, various structures etc.,

depending on laser parameters; hence, while cone heights *per se* are not discussed, variation of size overall is associated with control of fluence and use of ablation thresholds, etc.; hence, it would've been obvious to one of ordinary skill in the art to have controled their laser ablation parameters. Thus, debris patterns produced, dependent on the desired degree of roughness desired for a particular enduse, where the claimed height of structures from the substrate surface of between approximately 2-5 μm would have been within the bounds of cone heights or rim heights expected dependent on combinations of spot width and fluence of the laser.

Claims 1 & 8 are rejected under 35 U.S.C. **102(b)** as being clearly anticipated by **Burns et al**. (5,172,473).

Note 102(b) over Burns et al. is uncontested & maintained.

Claims 1-5, 7-8, 10-16, 18-20, 33 & 36 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Burns et al**., optionally in view of **Taylor et al**.

Burns et al. discuss cone formation via laser ablation. See the abstract; figures; col. 3, lines 6-22 to impurity particles in polyimide; col. 4, lines 35-col. 5, line 5+ using a mask to form core cones; col. 6, especially lines 7- 20 & 44-63, where a conductive layer is deposited on the cone, including a chromium adhesion layer, thus reading on appellants' definition of an adhesive. Above arguments for inherency/obviousness of ablation debris in formation of the cones, is again applicable, optionally including further relevant discussion by **Taylor et al.** concerning laser ablation producing cones with like materials (polyimides).

Note that for claim 1, as amended the mask of dots (col. 4, lines 45-59; col. 9, lines 10-30), which is opaque to the laser beam and forms conical projections in the polymer, which may be polyimide, reads on appellants' "initiator" and the claimed "shadows" therefrom, as amended, while the metallization of

the surface after the formation of the polyimide cones reads on applying "an adhesive" as redefined by appellants.

It is further noted that redeposition of ablative material does occur, as in col. 6, lines 51-53, Burns et al. explicitly note that it is necessary to plasma etch the cone patterned surface in order "to remove polyimide debris left behind from the laser ablation" before overall metallization is performed where metal adheres to the polyimide cones. It is also noted that the abstract specifically teaches "The individual conical projections are comprised of an ablative material,...", which is suggestive of redeposited ablated material being included in the cone composition; however, it could also be considered ambiguous language where it is possible that they might have meant material that can be ablated (although that is not what it literally says, however, as the laser formation of cones discussion in col. 9 notes that polymer was removed by laser from between the cones by optimized gas flow, this does not preclude accumulation of debris on the cones. In addition, with respect to previous discussion concerning Taylor et al., it would've been obvious to one of ordinary skill in the art to clarify the possible role of debris in cone formation as indicated by the above recited disclosures by reference to published mechanistic descriptions of the process as represented by Taylor et al., and in order to optimize their process to employ such mechanisms as applicable to the laser ablation cone formation process.

The examiner also notes that the size of cones preferred in Burns et al. is about 2-6 mils & = about 50-150 microns, which is larger than appellants' specifically claimed dimensions, such as in claim 33 or 36; however, Burns et al. also note that spacing and height of the cones is defined by the dirt expected to contaminate the surface of the cones, where smaller size and quantity of dirt expected may employ smaller and denser conical projections, hence particular size employed would have been determined by the expected dirt exposure, thus reasonably expected to encompass smaller sized cones for cleaner environments, such that it would've been obvious to one of ordinary skill in the art to employ smaller sizes where applicable. With respect to appellants' claims, it is noted that the particular height

has very little meaning, as there is no context with respect to how the structures formed affect either the coating or any enduses, such that their particular dimensions provide little significance.

Claims 9, 17, 21, 25-26 & 34-35 are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Brennen et al**., optionally in view of **Taylor et al**., as applied to claims 1-5, 7-8, 10-16, 18-20, 33 & 36 above, and further in view of **Murthy et al.** (6,120,131).

The Brennen et al. references, optionally in view of Taylor et al., do not suggest the specific species of enduse associated with elements of the print cartridge assembly, however a shown by Murthy et al. (abstract; background, including col. 1, especially lines 15-32 & 60-col. 2, line 25), use of adhesives and polymeric materials that are required to be adhered are old and well known for use in print head assemblies, were debris that specifically interferes with the adhesion is to be avoided; hence it would've been obvious to one of ordinary skill in the art to have employed techniques as taught in the combination, which improve adhesion and do not result in detrimental debris.

(10) Response to Argument

With respect to rejection of claims 1-5, 7-8, 10-16, 18-20, 33 & 36 over **Brennen et al. ((059) or (162)),** in **section B** of their arguments, appellants note that the examiner recognized that "applying an adhesive to the surface after formation of structures" was not explicitly taught; however, appellants have not argued the obviousness of such application as set forth in the above rejection, hence the obviousness thereof has not been refuted.

On pages 12-14, in **section (B1)**, appellants' arguments appear to be all directed towards limitations of accumulation of laser ablation debris on the surface in order to provide "initiators", which limitations are not present in claims 1, 3-5 & 7-9, hence the above rejection of these claims over Brennen et al. has not been refuted.

Appellants argue that Brennen et al. teach away from the mechanism of debris accumulation being involved in cone formation; however, their arguments are not convincing for reasons as stated in the above rejection, & because the teachings in [0086] which state "cone formation occurs when the fluence of a laser pulse at the substrate is not high enough to completely remove a whole layer of material. Even a small particle of material that remains of the previous layer may be enough to initiate the formation of a cone or cone-like feature...", contrary to appellants' allegations do not necessitate that the remaining small particle was "non-ablated material", but would also include any material that was ablated but redeposited, as it may also be described as not completely removed. Appellants note Brennen et al.'s teaching of controlling fluence in [0058] of (059), which notes lower threshold under which there is no ablation & upper threshold above which there is homogeneous ablation (presumably all material removed evenly across surface). This teaching for the fluences between the two thresholds neither explicitly includes nor excludes debris accumulation being involved in the process, as it does not specify how the ablation of the surface is incomplete such that particles remained that form cones, thus may be considered to encompass any mechanism by which particulates would remain, whether it be not ablating or redeposition of ablation debris, which was unable to be completely removed.

Furthermore, appellants' apparent assertion that due to taught "rapid ejection" debris cannot settle on the surfaces of Brennen et al.'s substrates during laser ablation (full paragraph page 13 of brief), is directly contradicted by [0091] in (059), which includes a final optional step in the laser ablation process that involves a cleaning station for cleaning "debris from the laser abrasion" from the substrate surface, thus clearly debris does redeposit, hence is consistent with above arguments concerning inherency or obviousness of that debris's involvement in cone formation, as its presence is consistent with the taught incomplete removal & particles remaining initiating cone formation.

Appellants' assertions on page 13 that in Brennen et al. "the use of extrinsic mass to effect surface texturing suggests that such mass may be necessary to produce surface texturing because ablation material

does not in fact resettle" is not convincing, since while Brennen et al. may use masks, they are not necessitated, nor do masks such as illustrated in figure is 5-9 provide a patterning for individual cone formation, thus these masks are not providing the pattern for individual cone formation, such as illustrated in the micrographs of figures 4A-H.

Appellants' continued arguments & reliance on Krajnovich et al., which is mentioned in Brennen et al., to assert that no debris mechanism can be involved in the cone formation process in Brennen et al., is not convincing, as Brennen at et al. do not teach that their process only proceeds by the mechanism discussed in this literature reference, but cites the reference as a reason why remaining particles may not be removed by subsequent laser pulses, thus whether or not Krajnovich et al. employ debris accumulation, neither necessitates nor prohibits debris accumulation from affecting the process of the primary references. Mere mention & citation of a literature reference in a patent specification does not require that specification to only employ mechanisms discussed in the cited literature reference, nor prohibit consideration of other mechanisms also known in the prior art.

With respect to the optional reference of Taylor et al., discussed in **section (B2)** of appellants' arguments, appellants further argue that Brennen et al. referencing Krajnovich et al. means that the primary reference teaches away from the involvement of resettled ablation debris in the cone formation process, apparently as an argument on why one cannot consider teachings from Taylor et al., which is again not convincing for reasons as stated directly above.

Appellants, on page 15 of their brief, appear to be further arguing with respect to Taylor et al. that since Brennen et al. did not explicitly state that their incomplete ablation that employs particles to affect cone formation, derived those particles from ablation debris, that one could not use teachings of Taylor et al. in Brennen et al. for use of the debris in cone formation, where appellants particularly note with respect to Taylor et al. "that such debris formation may be eliminated by increasing influence. '[H]igher fluences are required to totally remove the cone formation from larger diameter cuts (Taylor, p. 2817)";

however, the examiner further directs attention to Taylor et al.'s teaching in the paragraph bridging the first and second columns on page 2816, where Kapton (a polyimide) substrates are being treated, with it noted for experiments with laser fluence of 0.9 J/cm^2, that circular debris patterns were evident, although the amount of material was reduced from preceding experiments. This is directly relevant to Brennen et al.'s example 1 ([0126-133], especially [0126-127] & micrographs of figures 4A-H), which is also treating Kapton sheets to produce cones, as illustrated in the micrograph figures, using a laser beam fluence of approximately 450 ±100 mJ/cm^2 (i.e.~ 0.45 J/cm^2), which laser is applied to like materials at a lower fluence than that shown in Taylor et al. where laser ablation deposits debris on the surface; thus, Taylor et al. quite effectively provides evidence that further suggests debris deposition is occurring on the substrate surface in the process of Brennen et al., such that ablation debris accumulation may be to considered inherently or obviously be encompassed by the primary references' teaching of incomplete laser ablation leading particles on the surface that initiate cone formation, where Taylor et al. provides teachings enabling one to optimize energy fluences to employ various mechanisms dependent on desired cone configuration.

Arguments with respect to the rejection of claims 1-5, 7-8, 10-16, 18-20, 33 & 36 over **Burns et al.** & optionally in view of **Taylor et al.,** are set forth in **section C**. of appellants' arguments, where the examiner again notes that the rejection of claims 1 & 8 under 35 USC 102(b) as clearly anticipated by Burns et al. is uncontested. Furthermore, with respect to the 103 rejection, appellants' arguments as set forth on pages 16-17 appear to be directed solely to laser ablation debris involvement in cone formation, which as noted above is not relevant to claims 1, 3-5 & 7-8; hence, the rejection with respect to these claims also does not appear to be refuted.

In appellants' argument set forth in **section (C1)** of their arguments appellants' discuss Burns et al.'s use of projection masks in cone formation, the use of plasma etching <u>after</u> the laser abrasion to remove debris (see figure 7; col. 6, lines 50-53) & the lack of an explicit teaching concerning ablation

debris causing shadowing, to apparently assert that no mechanism involving ablation debris can be involved in cone formation; however, this is not convincing, because the use of masks as taught by Burns et al. does not prohibit ablation debris from depositing on the substrate, as clearly indicated by the need after completion of laser ablation to remove ablation debris, which would presumably be any ablation debris that is not part of the cones are firmly attached thereto. Furthermore, it is further noted in the section on col. 9, lines 10-30 concerning "Laser Formation of Cones", especially lines 27-30, which discusses laser ablation of the polyimide (PI or Kapton) film, that with respect to the ablation that "polymer was simultaneously removed by the laser from the portions of the contact between the cones", thus suggesting that that only material between the cones was removed, while any debris deposited on the cones would therefore have reasonably been expected to remain on the cones, thus contribute to their formation. Since the reference clearly indicates that laser ablation debris settles on the substrate (or it wouldn't need to be cleaned off afterwards) & that the laser ablation is only occurring between areas of cone formation, it is reasonable to conclude that debris depositing where cones are being formed would contribute to that formation, as ablation is taught not to occur in those locations.

Appellants' argument section **(C2)** refers back to their previous arguments against the use of Taylor et al., making no new arguments with respect to this optional reference’s combination with Burns et al. The examiner notes that Burns et al. are also affecting cone formation of the same material, Kapton, as discussed in Taylor et al., such that the evidence set forth in Burns et al., which indicates that debris does deposit on the substrate during ablation, would appear to indicate that the higher laser fluences that do not affect debris deposition are not been employed in the process of Burns et al., thus suggesting that the higher fluence mechanisms discussed in Taylor et al. that do not employ deposited debris in cone formation, are not those involved in Burns et al.'s process. Furthermore, that Burns et al. is using polymers (polyimide) as claimed by appellant & laser ablating via a shadowing technique, where debris is clearly depositing on the substrate, it is unclear how that same debris form like material can have a

different effect when forming cones in Burns et al.'s process, then when forming cones in appellants' process, thus appellants' arguments remain unconvincing.

Appellants' arguments with respect to dependent claims in **section D**, rely on their arguments in the preceding argument sections (C & B), thus provide no arguments why Murthy et al. not properly a with Brennen et al. or Burns et al., optionally in view of Taylor et al. to show the obviousness of such roughening processes used in print cartridge assembly, thus the obviousness of the claimed process or processes of Brennen et al. or Burns et al., as applied to the specific enduse of these dependent claims is considered not refuted.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Marianne L. Padgett/

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